



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/532,262

09/27/2005

John Mak

100325.0200US

8645

34284

7590

08/29/2008

Rutan & Tucker, LLP.

611 ANTON BLVD

SUITE 1400

COSTA MESA, CA 92626

EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

08/29/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/532,262	Applicant(s) MAK ET AL.	
	Examiner IVES WU	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-20 is/are allowed.
- 6) ☒ Claim(s) 1,5 and 6 is/are rejected.
- 7) ☒ Claim(s) 2-4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

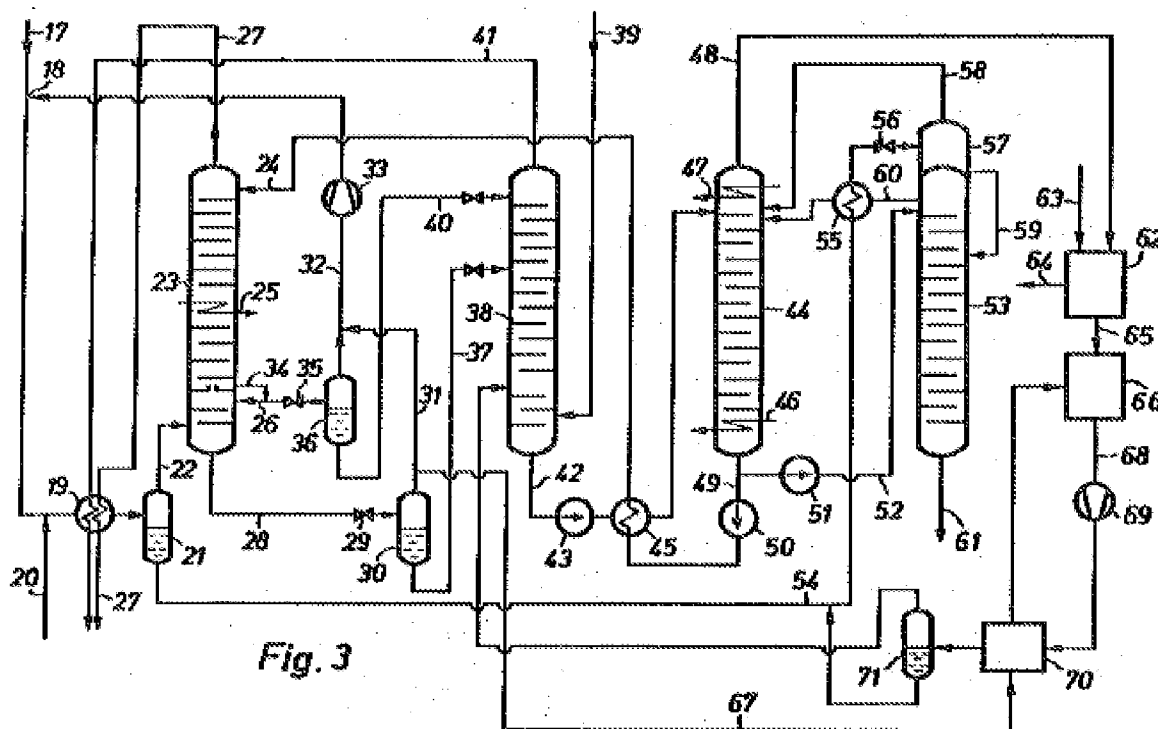
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(1). **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by Zeller et al (US04425317).

As to 1st scrubber in which a lean solvent absorbs carbon dioxide, hydrogen sulfide, and a hydrocarbon in a gas treatment plant in **independent claim 1**, Zeller et al (US04425317) disclose recycle of hydrogenated sulfur plant tail gas to sour gas scrubbing system (Title). As illustrated in the Figure below. There is scrubber 23, raw gas 17 - a crude gas rich in hydrogen, for instance a crude gas obtained from partial oxidation and subsequently carbon-monooxide shift conversion (Col. 6, line 17-20). The cooled gas is separated in a phase separator 21 from the condensate formed during cooling, this condensate being essentially the water and heavier hydrocarbons contained in the crude gas (Col. 6, line 26-29). Thereupon, the cooled gas stream passes through the line 22 into the lower section of a scrubber tower 23. In this embodiment, the gas is scrubbed in a scrubbing tower 23 have two different sections. Methanol loaded with carbon dioxide collects together with hydrogen sulfide in the sump of the scrubbing tower 23, (Col. 6, line 31-33, line 59-61), which would include hydrocarbon as well because hydrocarbon is soluble in methanol. As illustrated in Example 1, methane gas is in raw gas (Col. 9, line 4-5).



As to 2nd scrubber fluidly coupled to the 1st absorber in which at least part of the hydrogen sulfide being separated from carbon dioxide in a gas treatment plant in **independent claim 1**, as shown in Figure above, Zeller et al (US04425317) disclose to prevent hydrogen sulfide from escaping at the top of the hydrogen-sulfide enrichment column, carbon-dioxide loaded methanol from separator 36 is introduced through the line 40 at top of the column 40. This incompletely saturated methanol acts as scrubbing agent for the stripped-out hydrogen sulfide, whereby a sulfur-free stream of gas is removed from column 38 through the line 41, this stream consisting essentially of only carbon dioxide and nitrogen and being suitable for discharge into the environment after being heated by the gas stream to be purified in the heat exchanger 19 (Col. 7, line 16-27).

As to a sulfur plant to receive at least part of hydrogen sulfide to produce a sulfur product and a tail gas, wherein at least part of the tail gas being hydrogenated and being recycled to the absorber in a gas treatment plane in **independent claim 1**, as shown in Figure above, Zeller et al (US04425317) disclose the fraction removed from the top of the regeneration column 44 through

Art Unit: 1797

the line 48 containing the hydrogen sulfide separated from the gas stream as well as part of the separated carbon dioxide. This fraction is fed into the sulfur recovery plant 62 operating on the Claus reaction. Elementary sulfur generated in the sulfur recovery plant is removed through the line 64 in liquid form, whereas a flow of tail gas essentially consisting of carbon dioxide, hydrogen sulfide and sulfur dioxide passes through the line 65. This latter gas is hydrogenated in a subsequent hydrogenation stage 66. The hydrogenated tail gas is fed through line 68 into a compressor 69 which compresses it to the pressure of hydrogen-sulfide enrichment column 38 (Col. 8, line 4-9, line 15-20, line 40-42).

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(2). **Claims 5 and 6** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Zeller et al (US04425317). Evidenced by “Unit Operations of Chemical Engineering”, Ed. McCabe et al.

As to second scrubber being operated at a lower pressure and at a higher temperature than the 1st absorber in **claim 5**, Zeller et al (US04425317) disclose that hydrogen sulfide stage (2nd absorber) is generally operated at a substantially lower pressure than scrubbing stage of the

Art Unit: 1797

war gas (Col. 4, line 25-28). Zeller et al do not disclose the higher temperature in the 2nd absorber. However, it is obvious and well known in the art that to make the condition of desorption or stripping more favorable, the temperature may be increased or the total pressure reduced, or both these changes may be made (page 571, Unit Operation for Chemical Engineering).

As to carbon desorbed from the solvent in 2nd absorber having purity of at least 90 mol% in **claim 5**, Zeller et al (US04425317) disclose stream in line 41 consisting essentially of only carbon dioxide and nitrogen (Col. 7, line 24-25). It would include the stream of more than 90 mol% of CO₂ as claimed.

As to CO₂ to be used for enhanced oil recovery or used as commercial product in **claim 6**, the intended use is not to be considered as limitation and of no significance in the claim construction.

Allowable Subject Matter

(3). **Claims 7-20** are allowed.

Claims 2-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

/Jason M. Greene/

Art Unit: 1797

Primary Examiner, Art Unit 1797

Date: August 25, 2008

8/26/08